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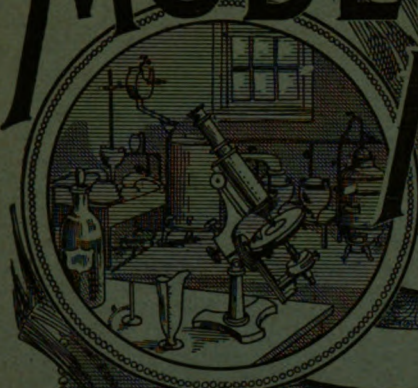
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EPIDEMIOLOGY

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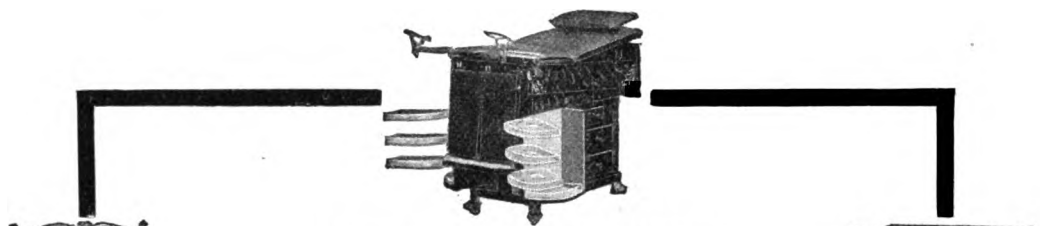
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# MODERN MEDICINE

VOL. XI.

BATTLE CREEK, MICH., U. S. A., AUGUST, 1902.

No. 8.

## ORIGINAL ARTICLES.

### TREATMENT FOR OBESITY.

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

(Concluded.)

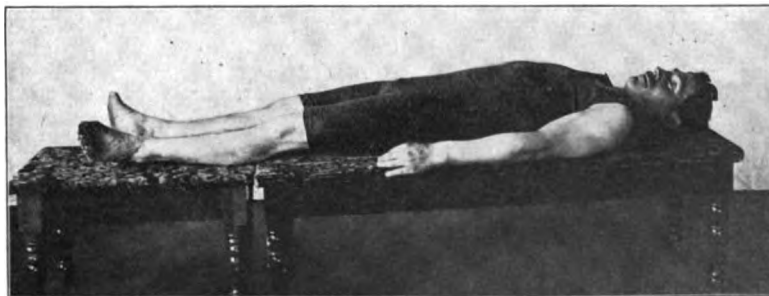
THE proportion lost for a person weighing twice his normal weight, would, of course, not be so great, though the actual loss would be the same. Considering the normal ration as 20½ ounces (16 ounces carbohydrate, 1½ ounces fat, and 3 ounces proteid), and cutting this down to 10½ ounces, consisting of 3 ounces proteid, ½ ounce fat, and 7 ounces of starch, the total number of heat units supplied the body would be as follows: Starch, 4,200; proteid, 1,800; fats, 540; total, 6,540, leaving almost exactly an equal amount to be derived from the tissues in order to maintain the ordinary vital expenditures for heat production and other forms of daily work. Starvation is, of course, the most effective of all means of reducing flesh; but starvation reduces energy as well as tissue, and at such a rapid rate that entire abstinence from food cannot be tolerated for any considerable length of time. Sometimes it may be necessary, indeed, to return to full rations a few days to give the patient an opportunity to recruit his energies; but when this is done, the patient should be made, if possible, to do some extra walking, or to take an extra cold bath, or to somewhat prolong his baths.

The cold bath not only consumes tissue but invigorates the whole body, energizing the nerve centers,

facilitating the movement of blood through the tissues, and increasing both the disposition to exercise and the capacity for muscular work. This is a point of the highest importance, and one which is worthy of most ample consideration in the preparation of a regimen for an obese person. The hot bath debilitates, depresses, and lessens the disposition and capacity for muscular work; it weakens the heart to such a degree that in many cases any considerable amount of active muscular exercise becomes impossible. Its effects are in this regard the very opposite of the cold bath.

Exercise not only consumes tissue, but by greatly promoting the absorption of oxygen through the lungs and the circulation of the blood, both encourages oxidation and aids in the cleansing of the tissues from the products of oxidation which result from exercise and the cold bath.

While the cold bath is much more efficient than the hot bath as a means of stimulating oxidation, the hot bath is, nevertheless, of service. It also stimulates oxidation, especially the oxidation of proteids. When the bodily temperature is elevated above the normal, either by a hot bath, by exercise, or by diminished heat elimination, as in fever, the oxidation of the proteid element and tissues of the body is greatly increased. As there is a rheumatic tendency in most cases of obesity through actual or relative deficiency in the supply of oxygen and consequent improper oxidation of proteid waste, the hot bath is almost uni-



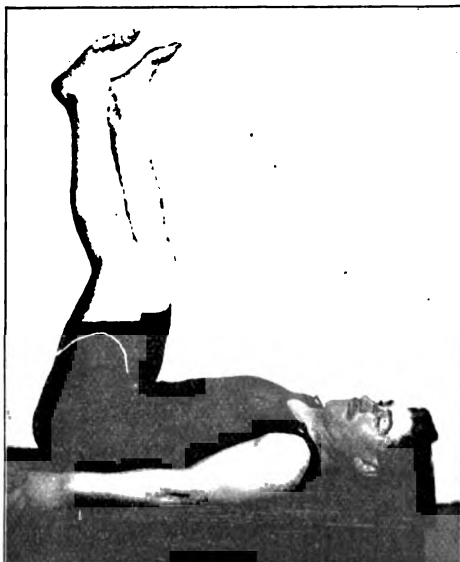
LYING OUT STRAIGHT ON BACK.



versally indicated as a therapeutic measure. My custom has been for many years to give the patient a sweating bath, preferably an electric-light or a vapor bath, which rapidly elevates the bodily temperature, first, through the penetrating power of the calorific rays, and second, through the interruption of heat elimination. The hot bath is continued for ten or fifteen minutes or even longer,—sufficiently long to produce vigorous perspiration, but not long enough to produce exhaustion.

It has been shown by Page, experimenting with dogs, that exposure of the animal to an atmosphere a few degrees above the body temperature, increases heat production to  $3\frac{1}{2}$  times the normal amount. This is due to the fact that while the reflex influence of heat acting upon the skin is to diminish heat production, the elevation of the temperature of the blood resulting from interference with heat elimination, stimulates the thermogenetic processes in the muscles, thus increasing heat production. It has also been shown by numerous accurate observations, that there is increased production both of  $\text{CO}_2$  and urea under the influence of an elevated temperature, showing increased oxidation of both proteids and the carbon compounds.

Assuming that the increase of heat



LEGS RAISED PERPENDICULARLY.

This would represent an increase of 180 heat units in ten minutes, or 1,080 heat units in one hour. This is exactly the number of heat units set free by the combustion of one ounce of fat, and would represent the burning up of one ounce of solid fat, or twice this amount of albumin, sugar, or glycogen. As the tissues contain considerable water, it is safe to say that the actual amount of reduction in bodily weight from this amount of oxidation would be not less than four ounces. By the administration of sweating baths twice a day, a patient can be made to lose half a pound of flesh, and by following this bath by a cool or tepid bath for thirty minutes an additional equal amount of oxidation may be secured, making a total reduction of one pound a day. Weight reduction at such a rate as this is much safer than if it were more rapid, and is much more

likely to be durable, as it gives time for the body to adjust itself to the new order of things, and the bodily energies are not so reduced as to interfere with functional activity of any sort.

Immediately following the hot bath, a cold bath may be advantageously employed in many cases, preferably a swimming bath or a prolonged sitting shallow bath. The duration of the bath must be regulated to suit the temperature of the bath and



LEGS FLEXED.

production in man is as great as in the dog under similar circumstances, we may easily calculate the amount of fat which may be consumed as a result of the hot bath of any given duration. The normal rate of heat production and elimination in men is 1.8-kilogram calories, or 7.2-pound F. heat units per minute. Three and a half times this amount is twenty-five heat units, an increase of eighteen heat units above the normal amount.



HEAD RAISING.

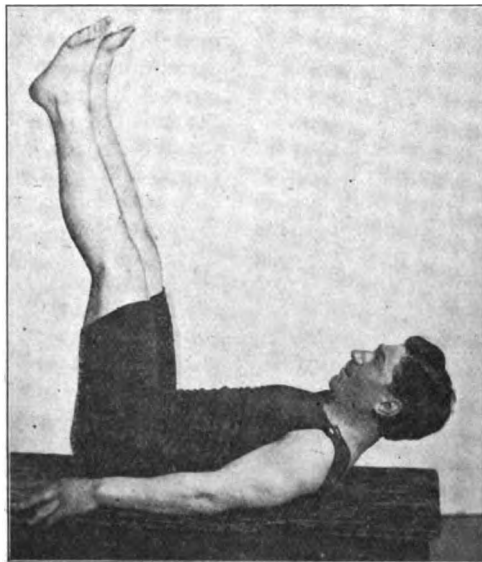
the patient's state of hydropathic training. If the temperature of the bath is  $74^{\circ}$  to  $78^{\circ}$ , it may be continued for fifteen to thirty minutes, provided care is taken to rub the patient frequently, or to have him rub himself, or exercise his limbs sufficiently to prevent chill. At a temperature of  $85^{\circ}$  to  $88^{\circ}$  the bath may be continued for an hour or two without injurious results. At  $65^{\circ}$  to  $70^{\circ}$  the duration should not be more than two to four minutes unless the patient is constantly rubbed, in which case if the temperature is not lower than  $68^{\circ}$ , the bath may be continued fifteen minutes.

Immediately following the bath, the patient engages in active muscular exercise, preferably walking. A five- to ten-mile walk, interrupted at intervals with a short run, not prolonged sufficiently to produce breathlessness, but just enough to produce perspiration, is advisable. The patient should wear sufficient clothing to produce perspiration readily. Stairway climbing or a treadmill may be substituted for mountain climbing when mountains are not easily accessible. Vigorous massage and manual Swedish movements should be administered daily as a means of encouraging blood movement and a breaking of oxidizable tissue. Patients who dislike walking may, if they choose, substitute gymnasium exercises.

muscles. Rowing apparatus with sliding seat furnishes an excellent exercise for those who are not too obese to be able to use the muscles conveniently in the required position. All sorts of leg movements in which the body is lifted are of service.

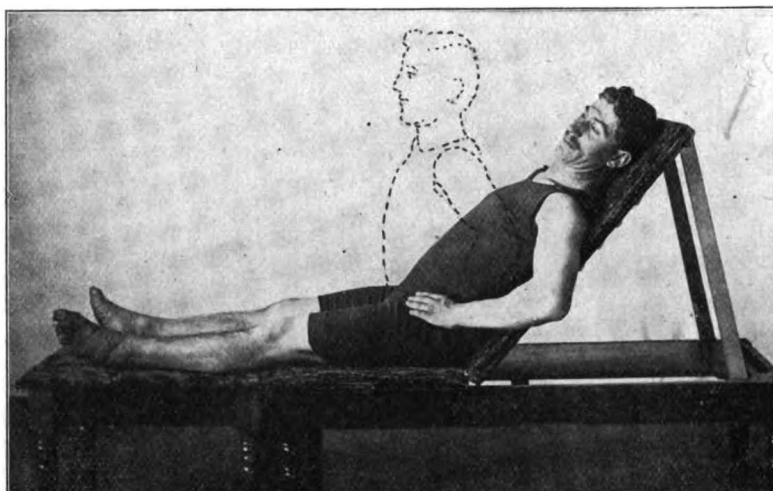
In case the exercise is in part or wholly prohibited on account of lameness, cardiac weakness, or some pulmonary affection, or renal complication, muscular exercise may be secured by means of the slowly interrupted sinusoidal current. The ordinary sinusoidal machines employed for this purpose are not satisfactory,

as the quantity of currents is so small that muscular contractions cannot be obtained unless alternations are rapid. The contractions thus obtained are tonic instead of interrupted, as desired. The contractions should occur at the rate of four to ten per second. All the principal muscles of the body may be vigorously exercised by placing the electrodes at a few convenient points. The arm muscles are exercised by grasping an



LEGS RAISED, HEAD RAISED.

electrode in each hand; the muscles of the leg by placing an electrode on each calf. The abdominal muscles and back muscles may be exercised by placing a large electrode in front and another electrode at the back; or for the back, one electrode may be placed at the upper part of the



LYING AT ANGLE OF 45°, TRUNK RAISING.

back, the other at the lower part; and for the abdominal muscles, one electrode may be placed at the epigastrium, and the other just above the pubic region, or a long electrode may be placed along each side. The current should be sufficiently strong to produce a vigorous reaction at every change of direction in the current. This may be readily secured by any form of rheostat which affords sufficient resistance. The rheostats employed for the galvanic current are generally arranged with too little resistance to control the sinusoidal current.

When the excessive accumulation of fat is chiefly confined to a single region of the body, — as the abdomen, the hips, or the chest, — some special local applications are of advantage in addition to the general measures above outlined. These are, localized applications of electricity, localized massage, special exercises, and hot and cold hydriatic applications. Localized obesity is due to deficient exercise of the affected parts. It is for this rea-



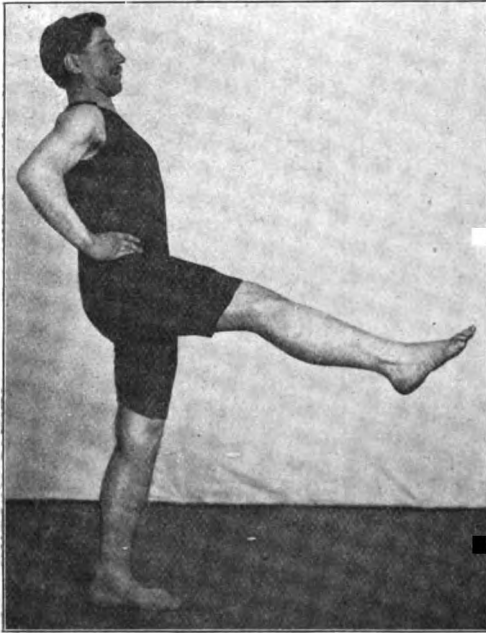
TRUNK BACKWARD BENDING.

son that judges, city officials, and other professional men so frequently acquire ponderous abdomens. The accumulation of fat is not merely subcutaneous. There is also an enormous fat accumulation in the abdominal cavity. The omentum sometimes grows to astonishing proportions. Massage applied to the ab-

dominal region for an hour once or twice a day, is an effective means of dispersing these abnormal accumulations. The same measures are effective for removing accumulations about the hips and chest. The measures must be thoroughgoing, and should consist of alternate deep-kneading movements and centripetal frictions. Special movements for bringing into exercise the abdominal muscles, or the muscles of the hips and chest, as the case demands, are required. These should be repeated at least four times daily, and should be continued for fifteen to thirty minutes each time. For developing the abdominal muscles, leg-raising movements are especially to be recommended. These may be taken by the patient, lying in bed upon the back. Both legs should be raised at the same time. If the patient is not able to raise both legs at the same time with the legs extended, the knees may be flexed partially or completely before raising. Head raising accomplishes the same purpose, but is less effective.



KNEELING, BACKWARD BENDING.



STANDING ON ONE LEG, OPPOSITE LEG RAISING,  
KNEE EXTENDED.

Raising of the head and legs at the same time is a movement of great value. The accompanying cuts illustrate a series of movements of which the author has made use for many years, in dealing with these cases and others in which special exercises of the abdominal muscles are required, especially in enteroptosis and displacement of the pelvic viscera.

The sinusoidal current should be applied with as much force as the patient can endure, and for fifteen minutes daily. The application should be made in such a way as to cause vigorous contraction of the muscles underlying the fatty accumulation. The electricity does not dissolve the fatty tissue, but by bringing the muscles into vigorous action, consumes the fat. The action is exactly the same as that by which deep-lying exudates in joints and in other parts are dissolved by stimulating applications to the surface. The filling of the superficial vessels diverts blood into the cutaneous branches of vessels which furnish the common blood supply for the skin and the underlying structure. The deeper vessels being thus robbed, draw upon the

surrounding tissues; and a drainage action is established which results in the carrying off of effusions and even solid exudates resulting from the coagulation of fibrin, after the latter have been dissolved by the action of the leucocytes. By the application of the sinusoidal electrical current and the setting up thereby of vigorous contractions in the muscles underlying fatty masses, the blood vessels of the muscles are dilated, and the thermogenic processes are stimulated to activity, thus consuming the oxidizable material stored in the muscle tissue. The blood supply to the overlying fatty tissue is thus lessened, and the fat-making elements are diverted to the muscle, and consumed instead of being further deposited in the already overburdened subcutaneous connective tissue. The deposits of fat are gradually depleted to maintain the excessive demand artificially created in the muscle beneath.

This activity is further aided by the application of the heating compress. The compress should be large, covering not only the affected area but an equal amount of surrounding territory. The compress should be thick,—at least ten or twelve thicknesses of cheese cloth or a double thickness of ordinary line towel, which should be wrung out of very cold water at 50° or 60°, and should not be wrung too dry. The compress should contain as much water as possible without dripping. The compress should not be covered with mackintosh, but with several



KNEES FLEXED, HIPS RAISED.

layers of flannel only, the flannel extending two inches above and below, so as to prevent cooling at the edges and chilling by evaporation. The compress should be changed every four hours, or before it becomes dry. The slow cooling kept up by evaporation will maintain constant

stimulation of the heat-making processes in the underlying tissues, and will encourage the circulation through the parts, thus not only promoting oxidation of fat, but the prompt carrying away of the resulting wastes. Twice a day the cold douche, either the percussion douche or the broken jet or a vigorous spray, should be applied with moderate force to the affected parts, at a temperature of  $50^{\circ}$  to  $60^{\circ}$ . A lower temperature may be employed when the patient has been sufficiently trained. The duration of the application should be from one to five minutes. The patient should be made to rub the parts vigorously during the application. If too great inconvenience results from the prolonged cold application, a hot application, lasting twenty to thirty seconds, may be employed at intervals of one to two minutes. It is a good plan to renew this cold application just before each application of massage and before each application of electricity. The massage and applications of electricity may be alternated, with a three-hour interval between the applications, a douche being applied each time just before the application of massage and electricity, and the heating compress after the application. The compress should be worn until time for the next application, also during the longer night interval.

It is not desirable that patients who have been extremely fleshy for many years should be restored



SITTING, SLOW TRUNK TWISTING TO RIGHT AND LEFT.



SITTING, SHOULDER MOVING TO LEFT AND RIGHT.

to their original weight. A patient who weighs from one hundred and fifty to two hundred pounds more than formerly should not expect a greater reduction in weight than seventy-five to one hundred and twenty-five pounds. In an excessive accumulation of fat, little masses of fat are wedged in everywhere between the muscle fibers, around, between, and about the abdominal viscera, and wherever this residual tissue can be stored. The entire removal of this padding leaves the tissues in a loose, so to speak, disjointed state. The support which has been afforded them by the snug packing is removed, and the patient is left in a weak and, as he not infrequently expresses himself, "in a tumbled-down state," with a feeling of going to pieces and the need of something to hold him together. The skin hangs in loose folds about him. This may be the case even about the limbs and chest. He has a chop-fallen appearance. The removal of fat to such a degree as this is in the highest degree pernicious. The obese patient should be content with the removal of such an amount of fat as will enable him to go about with comfort and save him the cardiac and pulmonary distresses and the degenerations to which obese patients are liable.

Cardiac and pulmonary complications require attention, but are not formidable obstacles when the system of treat-



ment and training suggested by this article is intelligently applied. The cold applications stimulate the heart and greatly increase its tone. The effect of the general cold applications may be increased by the application of an ice bag over the heart for fifteen minutes three or four times daily in cases of an extreme degree of cardiac feebleness as indicated by swelling or edema in other parts. Extremely cold baths, especially prolonged baths, must be avoided in such cases. The injurious effects of such an application will be made apparent by the blueness of the lips and skin surface, induced by such an application. Prolonged violent exercise indicates its harmful influence in the same way. Prolonged hot baths are equally injurious. Massage and the application of the sinusoidal electric current must be substituted for voluntary exercise. The cold applications must be more moderate and frequently repeated. It

may be necessary to employ even a temperature not lower than  $80^{\circ}$  to  $84^{\circ}$  at the first, until the patient has been gradually trained to endure a lower temperature. Cold towel rubbings, wet-sheet rubbings, and at first even the cold mitten friction, must be used in extreme cases instead of the shallow bath or the plunge. Heating baths may be employed only long enough to induce moderate perspiration, and the heart must be protected by an ice bag applied over it during the hot bath.

In cases of obesity accompanying Bright's disease, the same precautions respecting cold baths must be carefully observed, and the kidneys must be protected

by an ice bag applied over the sternum during the cold bath, and by a fomentation applied immediately after the application. The ice bag causes contraction of the arteries of the kidney, while the fomentation to the lumbar region relieves the renal circulation by diverting blood through the lumbar veins. □

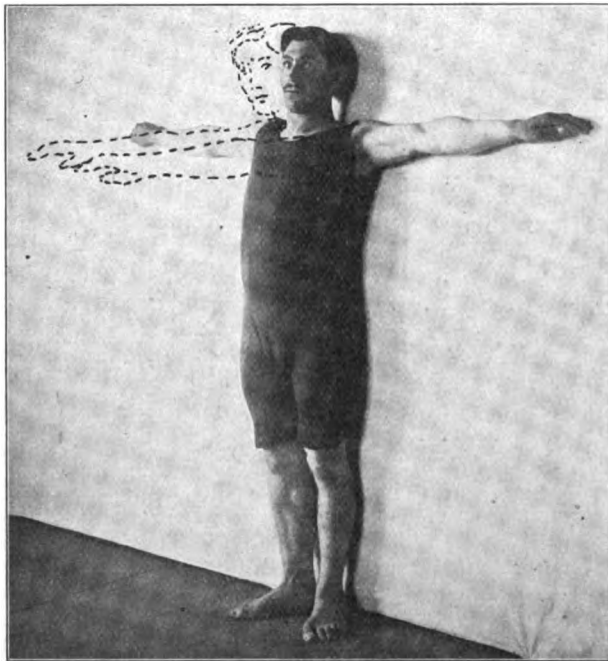
Cases of arterial sclerosis also require the same precautions indicated in cardiac weakness. Very hot and very cold baths, also violent exercise, must be avoided. In the application of massage, care must be taken to avoid excessive pressures, as the walls of the blood vessels are delicate

and are readily ruptured, producing ecchymosis and a annoying bruises.

In cases in which rheumatism is a prominent feature, hot baths followed by the cold towel rub, and prolonged neutral baths, may be employed instead of prolonged cold baths. The temperature of the neutral bath should be at the lowest limit,  $92^{\circ}$ , and when the patient becomes accustomed

to the application, the temperature may be gradually lowered to  $88^{\circ}$  and even  $85^{\circ}$ , or in some cases even lower, as the rheumatic affection improves. In cold applications, as the cold towel rub, especially painful joints should be protected by a hot fomentation or by wrapping with dry flannel.

The sand bath and the prolonged sun bath with frequent dips into the plunge, and the various other facilities afforded by the outdoor gymnasium, are especially valuable in the treatment of cases of obesity.



STANDING, HIPS, SHOULDERS, AND HEAD AGAINST WALL; ARMS SIDEWISE RAISING, ARMS FORWARD RAISING, HEAD FORWARD BENDING.

## TRANSLATIONS AND ABSTRACTS

[Two articles in this department are prepared expressly for this journal.]

**The New Campaign against Syphilis in Asia Minor.**—Prof. E. von Düring has long resided in Constantinople, and was intrusted in 1896 with the task of planning a campaign against syphilis throughout Turkey in Asia. The province of Kastamuni supplies the recruits for the capital, and the authorities found that every candidate was affected with syphilis, while entire villages have been wiped out by its ravages. It has been increasing for forty years in spite of occasional brief spasmodic efforts to eradicate it. Von Düring found entire provinces in which every peasant he met seemed to be syphilitic. He traveled on horseback, covering more than 5,000 kilometers (3,125 miles) during the last two years. He decided that numerous small hospitals were needed, supplemented by polyclinics and "flying columns." He now reports that he has ten hospitals nearly or quite completed, and several polyclinics; and the campaign is being pushed with vigor in the northwestern provinces. The total expense of these ten hospitals was only \$70,000, and he is himself amazed at the smallness of the sum; but, as he remarks, whole books might be written about the difficulties experienced in obtaining this amount, and in accomplishing the present results in spite of Oriental inertia. Most of the hospitals consist of three pavilions, models in every respect; the mountain streams supply pure water, and the drainage is perfect.

He states that in the province of Kastamuni alone nearly 25,000 persons need treatment every year. He found leprosy prevalent everywhere. The number of lepers is not large, but one or two were encountered in every village. They were formerly kept in strict isolation; the leper was driven away from the community, and compelled to live with other lepers in some secluded spot, but of late years these regulations have been disregarded, and the lepers mix freely with the populace. Zambaco's proclamation of the non-contagiousness of leprosy has probably something to do with the present laxness. He found that all the officials quoted Zambaco.

Düring's letters to the *Deut. Med. Woch.*, Nos. 12 and 23, contain interesting descriptions of the medical aspect of Asia Minor, the beautiful mountain scenery, and quaint therapeutic customs. He states that an alcoholic extract is made of the roots of the horseradish, which, according to the experience of the natives and the railroad employees, proves an effectual preventive of malaria, even in the most malarial districts. He can testify himself that persons who went into these districts to open up the railroad, did not contract malaria, and attributed their escape to this extract.—*Jour. A. M. A.*, July 5, 1902.

**Purin Bodies.**—Under the term, "purin bodies," T. Walker Hall (*British Med. Jour.*, June 14, 1902) includes all the substances containing the nucleus  $C_2N_4$ , including, as regards the pathologic possibilities, hypoxanthin, xanthin, uric acid, guanin, adenin, and the methyl-xanthins. The quantity of these contained in food and their excretions have been worked out by Burian, Schur, Loewi, and others. If we had a complete knowledge of the quantities of exogenous purins, the physician would be able to regulate at will the nuclein nutrition of his patients, hence the value of investigation of the subject.

In this article, Hall gives the percentage of purin bodies in different articles of diet. They are specially abundant in glandular substances, sweetbreads probably containing the largest proportion of anything that is commonly ingested; while they are at about the minimum in white bread and certain vegetables. Among the latter, peas, beans, and lentils seem to contain the largest percentages.

In the second part of the article, experiments are reported that are made by giving a purin-free diet to a young man with normal urinary excretion, and occasionally varying it with the purin-containing articles. He thinks that it is probable, allowing for variation, that the system excretes in urine within forty-eight hours, about one half of the fish, fowl, and beef purin contained in the food. Several patients were experimented on with special diets for the estimation of vegetable purins, and the results show an increase in the urinary purin each time the purin-enriched food was given.

We should, therefore, in the formation of a dietary, particularly note, in regard to the metabolic disorders, the purin contents in food stuffs as well as their protein percentages. Exogenous purin taken in the food can be usually controlled, but as regards the endogenous purin that is manufactured in the system, evidently but little is yet known. That it has a closer relation to body weight has been elsewhere shown by the author, and there is a certain amount of evidence which points to its variation with nitrogenous excretions. It might perhaps be taken as an index of the functional activities of the body. Leucocytic destruction probably only slightly affects its quantity. The last word, however, has not been spoken on the subject.—*Jour. A. M. A., July, 1902.*

**Recent Investigations of the Mechanics of Digestion.**—W. B. Cannon (Boston), in a paper on this subject read before the section on Physiology and Pathology, at the meeting of the American Medical Association recently held at Saratoga, N. Y., demonstrated some movements of the alimentary canal that are rather novel and unsuspected. His studies were carried out by the X-rays; the animals were fed, and afterward given pellets of bismuth subnitrate. These could be distinctly seen. The movements of the stomach were two: First, a tonic contraction of the cardiac end, while there was a wavelike contraction of the pyloric end. These pills, by this gradual motion, would come to the pylorus, and be pushed through to the small intestine. There was no sweeping motion or circulatory motion, as described; the food remained in the same relative position; this, therefore, allows salivary digestion to go on in the stomach for some time uninfluenced by the gastric secretions. These waves of the pyloric end are a reverse peristalsis, rather than peristalsis. In the small intestines a peculiar rhythmic, annular contraction takes place that divides and redivides the food; in the white rat it happens as often as sixty times a minute, in the dog and cat it is somewhat slower. This shows how well the food is mixed. In the large bowel there was a reverse peristaltic motion for some time, then there would be a tonic contraction that would work the food onward. Then this reverse peristalsis would work it back

again, and afterward carry it into the small bowel. In some animals that were fed by the rectum, and had been previously purged, the food could easily be seen working back into the small bowel. Another interesting observation was the fact that all these motions stop from fear, rage, and other cyclic influences.

**The Autogenous Diseases.**—V. C. Vaughan (Ann Arbor, Mich.), in a paper on this subject presented before the section on Medicine, at the meeting of the American Medical Association, recently held at Saratoga, N. Y., said that we had not as yet had sufficient data to enable us to attempt even a provisional classification of the autogenous diseases. He pointed out certain facts connected with this subject:—

1. The digestive organs may but imperfectly perform their function, and the products of their incomplete action may be absorbed, and may lead to more or less disturbance in certain organs of the body. Moreover, every part of the body will suffer more or less from insufficient nutrition, due to the fact that properly prepared pabulum is not brought within the reach of the cellular element. When peptones and albumoses are injected directly into the blood they act as powerful poisons.

2. That certain secretions and excretions of the human body are poisonous when brought into contact with tissues with which normally they have no relation, is well known.

3. It is the function of certain organs of the body to prevent the passage of certain substances into the general circulation.

4. That the undue retention of excrementitious substances frequently lead to disturbances of health, is well known.

5. That certain cells in the body fail to adjust themselves to general alterations taking place in other organs at certain periods of life, is quite evident.

6. Under conditions but little understood at present, certain cells of the body fail to utilize certain food stuffs. This is true in certain forms of diabetes. The cells which are accustomed to absorb and utilize the sugar, find themselves unable to accomplish this duty, and the unused sugar acts as a poison to other tissues.

7. Active poisons are sometimes formed by certain cells in the body. In this way

we account for the presence of certain of the more highly toxic leucomaines and some of the more poisonous acids, such as oxybutyric, and some of the poisonous gases, and some of the alkaloidal bodies.—*Am. Med.*, June 21, 1902.

**The Treatment of Erysipelas in the "Red Room."**—Herman Krukenberg (*Münchener medicinische Wochenschrift*, April 1, 1902) reports the treatment of eighteen cases of erysipelas by means of red light, in a room especially provided for this purpose. The results obtained were very satisfactory in that the duration of the disease was greatly shortened, in thirteen being less than two days; furthermore, systemic symptoms, such as fever and headache, were rarely observed. No general or local medication was given, except in three cases, in which alcohol was locally applied. In those cases in which the local lesions were sharply defined at the beginning of the treatment, such a definition began to vanish after a few hours in the "red room," and the swelling markedly decreased. Four of the cases relapsed after removal from the red light, but were speedily cured by a continuance of the treatment. The author does not think that red light in itself possesses any curative influences over erysipelas, but that the benefit derived therefrom is due to the exclusion of the chemical rays of the sunlight. The streptococcus of erysipelas does not appear to be materially injured by daylight, and the explanation of the benefit derived from red light is probably to be sought in the fact that the chemical rays irritate the skin, and make it particularly susceptible to the action of the streptococcus. It is possible that the beneficial results obtained in the local treatment of erysipelas with ichthyol, iodine, and various plasters, is principally due to the exclusion of the light thereby. This is shown by the speedy recovery of a case of facial erysipelas, which was treated in a dark room, in which, when illumination was necessary, a red light was used.—*Medical Record*, April 26, 1902.

**Hematuria.**—W. K. Otis (*N. Y. Med. Jour.*, April 19, 1902, Vol. lxxv., No. 16) gives a positive method for testing for blood in the urine. He takes urine that

has settled, and pours off until it has two or three drams of sediment, which is then carefully filtered. A small quantity of the sediment is then transferred on the point of a knife from the filter to a glass slide, and allowed to dry in the air. A little chloride of sodium is then rubbed with the point of a penknife to a very fine powder on the slide by the side of the dried sediment, and a few drops of glacial acetic acid are added. Over this a coverglass is laid, one edge of which is raised by a hair placed beneath it. The slide is then heated over a flame until the acid forms bubbles, when it is removed from the flame and glacial acetic acid added under the coverglass as long as it continues to evaporate. After cooling, the microscope will demonstrate, if the blood is contained in the urine, brown crystals in the form of staves or rhombic discs, which represent hemin or chlorohemin. These crystals are often small and imperfectly developed, but are easily recognized with a higher objective.—*Philadelphia Medical Journal*.

**A Simple Method for the Immediate Quantitative Estimation of Uric Acid in Urine.**—Ruhemann (*Berliner klin. Woch.*, Jan. 20, 1902) after briefly reviewing the literature of the means of estimating the uric acid in urine, explains his simple, quick, and practical method. For this he titrates with a solution of iodine, 1.5 gm.; potassium iodide, 1.5 gm.; alcohol, 15 gm.; and distilled water, 185 gm.; in an instrument of glass, called uricometer. On the bottom of this, sulphuric acid is placed, then the iodine solution is added, and the urine is dropped, one drop at a time, shaking after each addition, until the solution is pale pink. This, upon the last shaking, becomes milk white. Detailed explanations of this reaction are given. The sides of the uricometer are marked, the level of the mixture showing the amount of uric acid in the urine.—*Phil. Med. Jour.*

**The Blood in Tuberculosis.**—Appelbaum (*Berliner klin. Wochenschrift*, 1901, Vol. xxxix., p. 7) has studied the blood in cases of tuberculosis in Gerhard's clinic, with the following result: He divides the patients into those in the first, second, and third stages of the disease. Patients in the first stage of tuberculosis

may be considered in two groups. The first includes those in whom the disease has been of very gradual onset, patients who often have suffered from tuberculous affections (scrofula) since childhood. These are often tall, thin individuals, with characteristic phthisical chests, frequently with a family history of tuberculosis. In these cases the changes in the blood appear long before physical or bacteriological signs allow of a diagnosis. The second group are patients who appear in perfect physical health, well nourished, with well-shaped chests and without hereditary predisposition.

In the first of these classes there is well-marked anemia, the red-blood corpuscles averaging about 3,800,000; hemoglobin, 69 per cent; leucocytes, 6,500; specific gravity, 1.049; solid residue, 19.5 per cent.

In the second class the blood examination is absolutely normal.

During the second stage of the disease, however, with the development of fever, night sweats, and expectoration, the red-blood corpuscles are often normal in number, 5,000,000 to 5,500,000; hemoglobin, 90 to 95 per cent; leucocytes, 8,000 to 10,000; specific gravity, 1.058 to 1.060; solid residue, 22 to 24 per cent. This improvement the author justly considers to be only apparent, and due to the actual concentration of the blood.

In the third stage well-marked anemia develops. The average number of red-blood corpuscles is from 2,000,000 to 2,500,000; hemoglobin, 40 to 45 per cent; specific gravity, 1.040 to 1.042; solid residue, 15 to 18.5 per cent. There is usually a leucocytosis of from 15,000 to 20,000.

The differential count of the leucocytes in the first stage, in those patients showing the picture of an anemia, shows a relatively normal number of polymorphonuclear cells, and a slight increase of eosinophiles at the expense of the small mononuclear elements. In the second stage the eosinophiles become less numerous, the transitional forms rather more numerous; the relative percentages of the lymphocytes and polymorphonuclear cells are but little changed.

In the third stage there is a well-marked relative increase in the percentage of polymorphonuclear cells. The eosinophiles are diminished, and the transitional

forms relatively increased in number.—*Am. Jour. Med. Sciences*, April, 1902.

**Degeneration of the Islands of Langerhans of the Pancreas in Diabetes Mellitus.**—Wright and Joslin (*The Journal of Medical Research*, Vol. vi., No. 2, November, 1901, p. 360) refer to the work of Laguesse, Schäfer, Diamare, Ssobolew, and Opie on the degeneration of the islands of Langerhans of the pancreas in diabetes mellitus, and the probable disturbance of carbohydrate metabolism resulting from this lesion.

Among fourteen cases of chronic interstitial pancreatitis examined by Opie, the islands of Langerhans were shown to be the seat of hyaline degeneration in four. In three of these four cases diabetes had been present, but had been absent in the others. In the fourth case the islands were only slightly affected. What is more important, he found in two cases of diabetes mellitus in which there was no increase in the interstitial connective tissue of the gland, that these islands were extensively transformed into hyaline material. In one case the degeneration was strictly limited to the islands, while in the other, it extended beyond their limits. As a result of his observations Opie concluded that in pancreatic diabetes the lesion is of such a character as to destroy the islands of Langerhans, and that where, although the organ is diseased, diabetes is absent, the interacinar islands are relatively unaffected.

Wright and Mallory examined sections from the pancreas in nine cases of diabetes mellitus, and found the islands of Langerhans degenerated in two. In one of the cases the degeneration was very marked in these islands, and practically confined to them. In the other case the islands were less markedly involved, and the gland also showed fat necroses. The remaining seven glands were practically normal. It is well to note, however, that most of the material examined was in the form of stock sections in the laboratory, which had not, of course, been specially stained with the object of demonstrating this lesion.

The writers think, nevertheless, that their results are strongly in favor of the hypothesis that lesions of these islands are important factors in the pathology of this disease.—*Am. Jour. Med. Sciences*, April, 1902;



**Influence of Alcohol upon the Natural Resistance Against Infection.**—Goldberg (*Centralblatt für Bakteriologie und Parasitenkunde*, 1 Abth., 1901, Vol. xxx., pp. 696, 731) states that as a result of an interesting series of experiments made in the laboratory of Professor Chistovich (Tschistowitsch) the author arrives at the following conclusions:—

1. Doves which are naturally immune against anthrax become subject to infection after moderate doses (2 to 3 cm.) of 40-per-cent brandy, which produce only transient alcoholic intoxication, but do not result in the death of the animal.

2. Chronic alcoholic intoxication diminishes the natural resistance of doves against anthrax.

3. Small doses of alcohol repeatedly given to doves infected with fatal doses of a culture of anthrax do not save the life of the bird, and only exceptionally prolong their lives in comparison with control doves; sometimes they cause, apparently, the earlier death of the bird.—*Am. Jour. Med. Sciences*, April, 1902.

**On the Toxicity of the Cerebrospinal Fluid in Epileptics.**—Bellisari has shown that the cerebrospinal fluid of individuals suffering from general paralysis is more toxic than in normal individuals, and that this toxicity is at its maximum after an epileptiform seizure. Pellagrini (*La Riforma Medica*, Rome, 1901, Ann. xvii., Vol. ii., p. 638) has continued these researches with a view to determining the relative toxicity of the cerebrospinal fluid in epileptics. In his researches the puncture was made between the third and fourth and fourth and fifth lumbar vertebra. The quantity of fluid contained varied from 10 to 15 c.cm. Punctures were made in six cases of epilepsy. As a result of the inoculation of these fluids into guinea pigs the author arrives at the following conclusions:—

1. That the cerebrospinal fluid of epileptics is possessed of a markedly toxic power.

2. That injected into guinea pigs, it results always in grave and intense convulsive phenomena, so much so that in some instances a status epilepticus is produced; it has, therefore, a convulsive power.

3. That cerebrospinal fluid extracted immediately after the convulsion, has a

toxic and convulsive power considerably greater than that obtained at periods far removed from the paroxysm.

4. That the so-called anti-epileptic drugs exercise no influence upon the toxicity of the cerebrospinal fluid.

5. That cultures upon broth and gelatin from the cerebrospinal fluid of epileptics remain sterile. Lumbar puncture appears to have no influence upon the course of the disease.—*Am. Jour. Med. Sciences*, April, 1902.

**Malarial Disease, Prevention of.**—C. C. Beling (*New York Med. Jour.*, Dec. 7, 1901) suggests that the following simple rules will usually suffice to prevent malarial infection:—

1. Avoidance of fatigue and excesses of all kinds. Judicious, liberal diet. The use of alcoholic beverages in small quantities, particularly in warm countries; spices and condiments in small quantities; coffee, on account of its tonic properties.

2. The drinking water should be boiled, and filtered carefully, unless its purity is unquestionable.

3. Avoidance of exposure at night, which is the time the *Anopheles* usually bite. The protection of the dwelling house from mosquitoes by the use of fine wire or other screens. The destruction of those mosquitoes which have gained entrance into the house. The screening of beds at night.

4. The destruction of mosquitoes by the draining of stagnant holes, pools, drains, and other breeding places, and the destruction of the larvæ by the use of petroleum thrown on the surface of those pools which cannot be drained. One ounce of petroleum to fifteen square feet will destroy the larvæ, and continue to prevent their development from two to four weeks.

5. The isolation of the malarial patient from the *Anopheles*, should it exist in the same locality.—*Monthly Cyclopedia of Practical Medicine*.

**The Penetration of the Human Body by Ordinary Actinic Light.**—W. S. Gottheil and M. W. Franklin (*Med. Rec.*, April 19, 1902) state that light in a proper concentration from a source of sufficient actinic power can be made to penetrate the entire thickness of the human

body, including both surfaces of the skin; hence all the internal organs are accessible to its influence. Since no portion of the interior of the body, however, can be more than half the thickness of the frame employed from a cutaneous surface, and much of it is much closer, the time required for efficient actinic penetration to any depth is only a fraction of that employed in their experiments (which was 10, 20, and 30 seconds respectively); and conversely, if the time employed is equal, the chemotaxic effect will be far greater. The proof of the penetration of actinic light to and through the internal organs apparently opens a field for its successful employment as a therapeutic agent in internal maladies, in view of its admitted efficacy in a number of external affections.—*Philadelphia Medical Journal*.

#### Slow Rectal Injections of Weak Saline Solution in Septic Injections.—

Vernitz, Odessa (*Semaine Médicale*, 1902, p. 56), dissatisfied with the effects in septic infection of subcutaneous, intravenous, and rectal injections of salt solution, administered in the ordinary way, and believing that in view of the cardiac weakness in such cases it would be better neither to introduce into the system too large quantities of fluid at one time, nor to push the injection too rapidly, has tried a method of rectal injection recommended by Hegar, which is as follows:—

The canula introduced into the rectum is supplied by a receptacle filled with the fluid to be injected, and this fluid is allowed to flow into the bowel very slowly under very slight pressure, until the patient is sensible of a certain amount of tension; the receptacle is then lowered so as to cause part of the injected fluid to flow back into it; this process is repeated, the liquid being changed after a time if it is soiled by fecal matter. As soon as the rectum has been sufficiently cleansed, absorption by the mucosa commences to the extent of 500 to 1,000 c.cms. an hour; this is soon followed by more or less profuse diuresis, the relief of the thirsty and parched mucous membranes, and by abundant perspiration, which, unlike many critical sweats, is not accompanied by collapse or any distressing symptom, even though the temperature sinks to normal. As soon as the thermometer shows a rise, the injection is repeated in the same way

as before. Vernitz employs a 0.5 or one-per-cent solution of chloride of sodium, and has obtained excellent results in three cases of abortion with septic infection and very grave systemic symptoms, in one case of acute septicemia following a normal labor, and in a case of acute peritonitis due to an old salpingitis. He suggests that this method would be beneficial in eclampsia, which is now considered to be an acute systemic intoxication.—*British Gynecological Journal*, May, 1902.

#### Function of the Appendix and Its Relation to Various Maladies.—

Simonin (*Bulletin de la Société Médicale des Hôpitaux de Paris*) has made a careful investigation of the function of the appendix and its relation to various infectious disorders, especially inflammation of the throat, scarlatina, erysipelas, and acute inflammation of the ears. By careful study of the symptoms presented in these various disorders, the author finds that the appendix behaves exactly like a lymphatic gland, both by its mode of reaction before infection, and in its behavior when infected. It may be the seat of a veritable adenitis or of a periaadenitis with or without involvement of the mucous membrane. Inflammation of the appendix is very frequent in various infectious maladies, arising from the various specific pathogenic agents, either associated or secondary germs from the colon bacillus, the bacillus pyogenes, and especially the streptococcus.

These facts are worthy of careful consideration by those who recommend immediate removal of the appendix upon the manifestation of the first symptom of inflammation.

#### Crude Petroleum for Fecal Impaction.—

Dr. W. M. Robertson, of Warren, Pa., in a communication to the editor of *American Medicine*, calls attention to the fact that "it is not at all infrequent to find that high injections of water, olive oil, or any other of the liquid injections commonly used for overcoming obstructions of the bowel, are of little use, and various directions are given for overcoming the trouble. As a rule, the trouble is simply due to the inability of the fluid used to penetrate the hardened and almost water-and-oil-proof fecal mass, so that it may become movable.

"Physicians of the oil regions have found out by experience that the common crude oil, as it comes from the wells, is the best solvent now known for the disintegration of these masses. There is no fecal mass which it will not penetrate and soften. One quart of the oil should be introduced through a colon tube, and allowed to remain for twelve hours. There is usually no trouble about its retention. This treatment has been found to succeed after the most energetic use of water and sweet oil and glycerin failed to give relief. The crude oil has also been used internally, and there seems to be no reason why it should not be given by the mouth in conjunction with the rectal injections for obstipation. In that case it should be given with castor oil."—*Cincinnati Lancet-Clinic*, April, 1902.

**Toxicity of Penicilium Glaucum.**—M. di Pietro (*Il Policlinico*) in a contribution to the etiology of pellagra, has demonstrated the toxicity of penicilium glaucum. The poison is contained in the spores. It is insoluble in water, soluble in ether, alcohol, and chloroform. The toxin is active whether introduced by the stomach, peritoneum, or hyperdermatically. The dog, the rabbit, and the guinea pig are very sensitive to the poison as well as man. The symptoms produced by this poison are muscular trembling, chronic spasms, paralyzes, and other symptoms closely resembling those of pellagra.

**The Alkalinity of the Blood.**—Brandenburg has shown (*Deut. Med. Woch.*) that the alkalinity of the blood diminishes in grave anemia, in fevers, and particularly in pneumonia. Of the alkalines in the blood, eighty per cent are combined with the albuminoids and twenty per cent are diffusible. When the alkalinity diminishes, the amount of diffusible alkali increases. It may rise as high as thirty per cent.

**Treatment of Uterine Discharge by Brewers' Yeast.**—Dr. Neves, of Lisbon (*La Tribune Medical*), communicates the results of a series of cases of gonorrheal or nongonorrheal discharges from the uterus treated by means of brewers' yeast. In all cases there was

cure, or, at least, great amelioration. It is best used fresh, and not alone, but as an adjuvant to other measures. The flow soon diminishes, loses its purulent character, and ulcers cicatrize.—*Indian Lancet*.

**The Origin of the Sugar in Diabetes.**—Dünschmann (*Deut. Med. Woch.*) following the work of Pavy, in a study of experimental glycosuria determined the origin of urinary sugar to be as follows: (1) Carbohydrates not assimilated or not assimilable; (2) glycogen transformed into sugar in too great quantity; (3) the destruction of proteid substances liberating sugar; (4) carbohydrates formed from animal and vegetable fats.

**A Woman Ambulance Surgeon.**—For the first time in the history of New York City, a woman, Dr. Emily Dunning, has become an ambulance surgeon, having been appointed at Gouverneur Hospital. She is a graduate of Cornell, where she took her degree with honors.—*Phil. Med. Jour.*

**Discussion upon Spinal Anesthesia.**—Hendrix (*Jour. de Chir. et Annales de la Soc. Belge de Chir.*, No. 7, 1901) states that Bier, the discoverer of this method of anesthesia, has stated that he considers it more dangerous than chloroform, disapproves of the enthusiasm with which it has been received, and that it should never be employed without full knowledge of those modifications which have been found to be indispensable.—*Am. Jour. Med. Sciences*, April, 1902.

**Potato Diet in Diabetics.**—M. Mosse (*The Lancet*, Jan. 4, 1902) supports the theory recently put forward by Dujardin-Beaumetz that of all starchy substances potato is the least harmful to diabetics, and holds that it is actually beneficial, and constitutes an essential element in the treatment of diabetes. He gives potato in place of the ordinary ration of bread, in proportion of three times the weight.

Far from increasing the sugar, the use of potato diminishes its output, and clinical examination of the urine shows that the carbohydrates of the potato are absorbed and utilized. The results are bet-

ter in that form of diabetes which is marked by thinness than in the fat form. The potato containing weight for weight twice the amount of water that bread does, and nearly the same quantity of potassium salts, a patient taking three times as much by weight of potato as he would of bread gets six times as much water and three times as much potassium salts, while the starchy matter remains unchanged. Potassium salts are an integral part of the alkaline treatment of diabetes, and the good which they do easily counterbalances the harm done by the ingestion of the starchy matter. Under the potato treatment, the sugar disappears, and the appetite and general health improve.—*Charlotte Medical Journal*.

**Saline Injections in the Vomitings of Pregnancy.**—Condamin, Lyons (*Semaine Méd.*, 1902, No. 3), has treated eight cases of persistent vomiting of pregnancy by the systematic injection, preferentially by the rectum, of from three to four litres of artificial serum daily, in divided doses of three hundred grammes each. The injection is made so slowly as to occupy from ten to fifteen minutes, and is arrested if it induces peristalsis, to be recommenced when the movements have ceased. Should there be intolerance, a few drops of laudanum may be added, or, if necessary, the serum may be introduced hypodermically. During the ten days or so that the treatment is continued, the patient takes neither liquids nor solids by the mouth, and then, while the injections are continued for several days, oral nourishment is gradually increased from a few mouthfuls to the ordinary quantity. This treatment is based on the idea that the persistent vomiting of pregnancy is due to general intoxication, and averted the necessity of inducing abortion in any of the eight cases in which he has adopted it.—*British Gynecological Journal*, May, 1902.

**Relation of the Nervous System to the Automatism of the Heart.**—Friedenthal has recently shown (*Centralblatt für Physiologie*, 1902) that the nervous system alone is incapable of producing permanent arrest of the heart, or of re-establishing the action of the heart when once completely arrested. The heart may continue to beat regularly after its

nerves have been divided. His observations also seem to show that the activity of the heart does not depend upon the presence of ganglionic cells. W. Green, (*American Journal of Physiology*, 1902), who has studied this question in the hagfish, showed that in the animals experimented upon, at least excitation of the pneumogastric produced no change in the cardiac rhythm. Excitation of the brain and cord likewise produced no effect. This author draws from his observations the conclusion that the automatism of the heart is a function of the cardiac muscle.

**Metabolism in Gout.**—Waldvogel (*Centralblatt für Stoffwechsel und Verdauungs-Krankheiten*) has shown that in persons suffering from gout—that is, during the interval between the crises, a marked retention of nitrogen appears due to the slight elimination of the products of the destruction of the nucleins. There is a diminished uric-acid elimination. There is also diminished elimination of phosphoric acid. During an attack of gout, there is a slight increase in the amount of uric acid eliminated. This condition exists, however, without evidence of renal insufficiency.

**Patent Medicines.**—Dr. Albert Robin, bacteriologist and pathologist of the Delaware Board of Health, strongly deprecated the "patent-medicine habit" in a paper read before the Philadelphia College of Pharmacy, February 18. Patent medicines demoralize the people by engendering constant dread of disease, so-called 'pathophobia'. Dr. Robin told how a vaunted remedy, sold at one dollar a box, was composed of granulated sugar; how certain opium cures contain morphia; and tonics especially recommended for inebriates are largely made up of alcohol.—*St. Louis Medical Review*.

**The Role of Albumin in Metabolism.**—This interesting question has recently been studied by Max Gruber (*Zeitschrift für Biologie*, 1901), who concludes that the organs (that of the protoplasm and of the cell nuclei) undergoes little or no change, although the nucleus itself is constantly active forming and destroying organic compounds. The

conversion of sugar into glycogen, and of hydrocarbons into fat, together with the decomposition of the food, maintains the normal composition and concentration of the organic liquids. The destruction of albumin appears to be the result of the action of an enzyme which undergoes oscillations in its activity. During the process of its development, one organ may grow at the expense of another, as illustrated in the development of the genital glands at the expense of the muscles in the salmon. Albumin exists in the body, according to Voit, in two forms, stable, or organized, and circulating. The suggestion that the so-called circulating albumin may be really imperfectly oxidized products of decomposition, especially creatinin, the author shows to be unfounded, by proving the very rapid elimination of creatinin.

Tallquist (*Archiv für Hygiene*, 1902) has shown by recent researches that the carbohydrates are more important than fats in replacing albumin.

**Reabsorption through the Urinary Tubules.**—A. Cushny, in a study of the function of the kidney (*Journal of Physiology*, 1902), has shown that reabsorption takes place through the epithelium of the urinary tubules; but that under ordinary conditions only water and the chlorides are reabsorbed, while the sulphates, phosphates, and urea, being less diffusible, escape reabsorption. This makes clear the method by which the excretory elements of the blood are concentrated to form the urine. Entering with the blood serum through the capsule, the concentration is effected by the absorption of the water and chlorides as the serum flows over the epithelium of the tubules. The epithelium covering the tubules thus acts in a manner essentially identical with that of the intestinal mucous membrane.

**Pathology of Eclampsia.**—A. Boissard (*Bull. de la Soc. d'Obst. de Paris*, No. 7, 1901) presents the liver from a fatal case of eclampsia with coma, jaundice, albuminuria, and hematuria. The liver was filled with hemorrhagic areas which had encroached upon and destroyed many hepatic cells. In the autopsy of another case of eclampsia the liver also showed lesions. J. Thoyer-Rozat (*ibid.*) found punctate hemorrhages upon its

inferior surface, and also localized emphysematous areas. The writer does not consider these the result of post-mortem changes, although the autopsy was performed thirty-six hours after death. No bacteriological examination was made.—*Am. Jour. Obst. and Dis. of Women and Children*.

**Insect Repellants.**—It is claimed that no mosquito can endure the odor of the oils of citronella or of pennyroyal, and that the odor of the oil of mint repels, and the odor of thyme attracts, the insects. A box of mignonette and geraniums in blossom in a window are as effectual in barring the entrance of a plague of flies as a wire screen, and far pleasanter to the eye. Flies have a decided aversion to the oil of bay leaves, and a few drops in a dish placed near the window will prevent their unwelcome visits.—*Dental Summary*.

**The Cause of Blanching of the Hair and Beard.**—E. Metchnikoff (*Annales de l'Institut Pasteur*) in a biological study of old age has shown that the loss of color of the hair and of the beard is due to the action of certain cells which destroy the pigment found in the outer layers of the hair. These cells are known as pigmentophages. They are said to be of epidermic origin.

**Intestinal Putrefaction.**—Backman (*Zeitschrift für klinische Medizin*) has shown that intestinal putrefaction may be diminished by a farinaceous diet as well as by a milk diet. Putrefaction is increased by an excess of fat or of albumin.

**The Action of Ptyolin.**—Maszewski (*Zeitschrift für physiologische Chemie*, 1901) has shown that for a given quantity of saliva, a certain degree of concentration of the starch exists which furnishes a maximum quantity of sugar; one c.c. of saliva for a quantity of starch sufficient to make a two-per-cent solution. For a constant quantity and concentration of starch, an increase in the proportion of diastase does not increase the quantity of sugar formed, but diminishes it. These astonishing results are similar to those obtained by Biernacki in a study of the glycolytic ferment.



## BACTERIOLOGICAL NOTES.

[The notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

On the Presence of the Bacillus Eberth in the Blood and in the Rose Spots during Typhoid Fever.—Courmont (*Journal de Physiologie et de Pathologie générale*, 1902, vol. iv., p. 155) has made careful studies of the blood in all cases of typhoid fever entering his wards during the year 1901, nine in number. The typhoid bacillus was found in the circulation in every instance, and in many cases it was found at several different times in the course of the disease, leading the author to the conclusion that it is present in the blood as a rule in typhoid fever. In no instance did he obtain other than pure cultures. The bacillus may appear at an early period, inasmuch as it was found in one case on the fifth day. In order to obtain these results it is necessary to use a considerable quantity of blood in a large quantity of bouillon. In fourteen instances in which several drops of blood were inoculated in about 20 c.c. of bouillon, only three positive results were obtained. He is inclined to believe that one should employ 300 c.c. to 500 c.c. of bouillons, which should be inoculated straightway from the syringe, and introduced immediately into the thermostat. The results are by no means so good when the blood has been allowed to clot before taking the culture.

In some instances at the end of twenty-four hours the bouillon may seem sterile, but on shaking it up thoroughly a growth usually follows. From 2 c.c. to 4 c.c. of blood should be used.

The virulence of the bacilli obtained was rather marked. Their agglutinability was almost invariably markedly inferior to that of bacilli which had been maintained for a long time in artificial cultures. They were, for instance, agglutinated commonly at a dilution of 1:50 by a serum which agglutinated laboratory bacilli at 1:200. These characteristics were retained by the second or third generations. After many generations, however, they became less agglutinable. The typhoid serum acts apparently in the same manner upon its own bacilli as upon

others. There is no special sensibility of the bacilli in any given case to the serum of that particular patient.

There appears to be no relation between the presence of the typhoid bacilli in the blood and the agglutinating power of the serum. In four of the nine cases the bacilli were obtained while the agglutinating power of the serum was absolutely nil. The author concludes: "A search for the bacillus of Eberth in the blood by the above-mentioned method, should be undertaken to make an early diagnosis of typhoid fever in every instance in which the Widal sero-diagnosis is negative."

Yet more remarkable are the results reported by Polacco and Gemelli (*Centralbl. f. innere Medizin*, 1902, vol. xxiii., p. 121). These observers have made a series of cultures from the rose spots in fifty typhoid patients during an epidemic lasting from July until November, 1901. They used the method of Neufeld, with certain modifications. The most important points they believe to be the necessity of taking a little of the tissue as well as the blood from the rose spot, and to use fluid culture media. In obtaining the substance they used the "Vaccinostyle Maréchal." They took their cultures always from at least two spots. The method is so simple that it is practicable with even small children. Positive results were obtained in every case, in many instances before the Widal reaction had appeared.

[It will be interesting to see whether these surprising results will be confirmed by other observers. Cole, in Professor Osler's clinic, has been able to demonstrate the presence of typhoid bacilli in the circulating blood by methods very similar to those of Courmont, in about 80 per cent of the cases, not infrequently before the development of the Widal reaction or before the appearance of roseola. A simple and practical method of demonstrating the presence of typhoid bacilli in the circulation in the first week of the fever, would be of inestimable clinical value.—W. S. T.] — *Am. Jour. Med. Sciences*, May, 1902.

**Danger in Dust.**—Here are a few of the components of dust: fine earth, fragments of wood, cotton, wool, and almost everything under the sun, dried excreta, spittle, filth from the gutter, and every possible kind of offensive matter.

**The Bacteriology of Acute Dysentery in the United States.**— Under the direction of Flexner, Vedder, and Duval (*Journal of Experimental Medicine*, 1902, Vol. vi., No. 2, page 181) have undertaken to solve two problems: 1. To determine by comparative study whether the organisms described by Shiga in Japan, by Flexner and Strong in the Philippines, and by Kruse in Germany, are of the same species. 2. To discover the cause of acute dysentery in the United States, and if possible to identify it with the organisms of the observers mentioned. In other words, to determine whether acute dysentery is the same, the world over, and whether it be due to a specific organism, *bacillus dysenteriae* Shiga.

After briefly describing their technique, they state that before the organism under consideration can be considered to be *bacillus dysenteriae*, it must have fulfilled the following requirements:—

1. It must give the proper cultural characteristics, as shown by standard cultures of Shiga, Flexner, and Kruse.
2. It must possess the right morphology, as shown by the same.
3. It must give a positive agglutinative reaction with the same of the known dysenteric sera.

Their material was drawn from various sources. The *bacillus dysenteriae* was grown from the stools of five different cases studied in various Philadelphia hospitals. It was also obtained in three cases of dysentery which occurred in the Lancaster County Almshouse and Insane Asylum, where several deaths from the disease had occurred. They also had the opportunity of studying a severe epidemic of dysentery which broke out in the Springside Home, New Haven, Conn. In this epidemic more than fifty cases occurred within three weeks among the 350 inmates, all being of a very acute form, with fatalities. They obtained the bacillus in fourteen of these cases which they studied. Three of these were insane patients.

They describe in detail the cultural characteristics, morphology, and agglutination reactions of the organism. The agglutination tests were made with the organisms obtained from Shiga, Flexner, Kruse, and Strong, and with the organisms which they isolated from their own pa-

tients. The tests were made with the blood of the patients they observed, and also with a sample of antidysenteric serum sent by Shiga to Flexner. Briefly stated, the agglutination reaction was practically identical with all the organisms.

As a result of their study of the cases in this country, they firmly believe that there is a specific bacillus, and that it is identical with the organism described by the observers mentioned. They have no doubt that the organism is pathogenic. It is interesting to note that in no instance have characteristic intestinal lesions followed inoculation of animals with the organism. Flexner and Strong have produced typical dysentery in man, following the ingestion of *bacillus dysenteriae*.

It is important to note that the organism in this country has been found both in sporadic and epidemic cases; also that it is apparently the cause of acute dysentery in the insane. It is also present in the cases of "terminal" dysentery in association with chronic Bright's disease.

Conclusions:—

1. The several standard cultures used in this study are indistinguishable—a conclusion previously reached and stated by Flexner.
2. The acute dysentery of the United States is due to a bacillus indistinguishable from that obtained from the epidemics of dysentery in other parts of the world.
3. The sporadic and the institutional outbreaks of acute dysentery are caused by some micro-organism, and this organism is identical with that causing epidemic acute dysentery.
4. The cause of acute dysentery, whether sporadic, institutional, or epidemic, is *bacillus dysenteriae* Shiga.—*Am. Jour. Med. Sciences*, May, 1902.

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**The Micro-organisms of the Human Fecal Matters.**— In a careful bacteriological study of the fecal matters, Matzschitta (*Archiv für Hygiene*) has isolated forty-four species of microbes, many of which resemble the colon bacillus. The best medium was found to be hepatic agar. A slightly acid medium was found to be preferable to an alkaline. Most of the species were erobic, and as many as eighteen million colonies were found in a single milligram of feces.

**Germes Spread by Insects.**—Joseph Mc Farland (*Medicine*, January, 1902) writes with reference to this subject as follows:—

1. Insects may carry from place to place disease-producing micro-organisms which have collected upon their bodies and limbs, and occasion infection directly by alighting upon wounds, and indirectly by alighting upon foodstuffs. It is very likely the common housefly that is most culpable in this direction.

2. Insects may carry within their bodies germs of disease which have entered with the food, and which may subsequently be deposited elsewhere with the feces. This has been demonstrated in connection with tuberculosis, where tubercle bacilli, live and virulent, have been detected in the feces of flies that have been fed upon tuberculous sputum. Such infected fecal matter, being deposited where it directly or indirectly infects the individual, becomes a matter of evident importance.

3. Suctorial insects, by taking blood containing parasites from the bodies of diseased animals, may carry these upon their proboscides into the next animal bitten, directly and immediately infecting it.

Many cases of anthrax have apparently been brought about by suctorial flies. It has also been repeatedly stated that plague may be propagated by such direct infection from the bites of fleas. In certain parasitic diseases it has been clearly demonstrated that the bites of insects are accompanied by direct infection.

4. Insects may take infectious germs into their bodies and transmit them to their offspring, whose bites are infectious. The disease in which this is best seen is the Texas cattle fever.

5. Insects may take into their bodies parasitic organisms which there undergo a further development, the insect acting either as an intermediate or a definite host, and transmitting the parasites to other animals in some changed form in which they are infective. As illustrating this form of parasitic disease, the malarial infections of mammals and birds stand pre-eminent.

A second important affection in which the mosquito appears to play the part of a definite host is yellow fever.

A third disease, in the transmission of which insects are concerned, is filariasis.

6. The insects may become infected with pathogenic organisms, die, fall into food stuffs, and thus impart infection to man.

The probability of this being an important source of infection is not great, as such accidents are rare. When one remembers, however, that Yersin and Nuttall have found that flies become infected with plague and die of the disease, the danger that might lurk in such an insect cadaver need not be magnified.

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**Bacillary Dysentery.**—The conclusions which Flexner (*Therapeutic Gazette*) deduces from the data available are:—

1. The acute dysentery of Japan, Philippine and West Indian Islands, of Germany and of the United States, is due to bacilli indistinguishable from each other.

2. Certain cases of chronic dysentery owe their beginning to the same organism.

3. The sporadic and institutional outbreaks of acute dysentery are caused by bacillus dysenteriae, and this organism is identical with that causing epidemic acute dysentery.

4. The acute bacillary dysenteries are attended by diphtheritis and ulceration of the intestine.

5. When diphtheritis complicates amebic dysentery, a mixed or terminal infection with the bacillus is to be suspected. —*Jour. A. M. A.*, May 17, 1902.

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**The Multiplicity of the Toxins Produced by One and the Same Bacterium.**—A. Charrin (*Deutsche medicinische Wochenschrift*, April 17, 1902) draws attention to the fact that in explaining the symptom-complex of the various infectious diseases it is necessary to consider the various toxins produced by the causative micro-organism. It is certain that we can no longer explain such a symptom-complex on the supposition that it is produced by only a single toxin. Advances in bacteriology have shown that any given pathogenic micro-organism produces a variety of toxic products, and as our knowledge along this line widens, these products increase markedly in number. The author's researches with the bacillus pyocyaneus have shown that this micro-organism produces a variety of

products, such as various pigments and different ammonia and amide combinations, all of which possess pathological properties. Furthermore, the effects of the latter volatile products appear sooner after infection than do the effects of the toxin proper, and it seems certain that the action of the former increases the susceptibility of the body to the toxin proper. The development and number of these pigments and volatile products depend not so much upon the particular variety of bacillus pyocyaneus used, as upon the media employed for its growth. The immunity produced, however, is always due to the action of the toxin proper. The accessory products, so to speak, appear to be due to special properties of the micro-organisms, which are developed as the result of growth upon different media and under various external conditions. In this manner the diversified symptom-complex produced by infections with one and the same bacterium may be easily understood.—*Med. Rec.*, May 17, 1902.

**Bactericidal Action of Röntgen Rays.**—Dr. H. Rieder in 1898 began a series of observations on the bactericidal activities of the Röntgen rays, which are continued, and the further results reported (*Münchener Med. Wochenschrift*, 1902, No. 10, p. 402). Cultures of the cholera spirillum, the colon bacillus, and the bacillus prodigiosus in Petri dishes were exposed to the action of the rays for from twenty to thirty minutes, after which time it was shown that many of the organisms were killed, and multiplication ceased in nearly all. Animal experimentation, however, has shown that these activities are not as apparent in man, and it is even questioned whether the effects of the X-rays on lupus is a result of antibacterial activity.—*Am. Jour. Med. Sciences*, July, 1902.

**Neutral Red as a Means of Detecting Bacillus Coli in Water.**—Several investigators have found that media containing neutral red are changed in color to canary yellow by *B. coli communis*, but not by *B. typhosus*. The reaction was found to be constant in an investigation of a large number of races of the

organism, but it was shown also that it is brought about by certain other bacteria, including *B. tetani*, *B. edematis maligni*, *B. anthraxis symptomatici*, and *B. enteritidis*. Most of the aerobic pathogenic bacteria were tested with negative results. In order to ascertain whether the reaction affords a rapid means of detecting *B. coli* in water and of estimating the number present, R. H. Makgill (*Journal of Hygiene*, October, 1901, p. 430) undertook a series of experiments, which led to the conclusion that a water producing a typical canary yellow in neutral-red media within forty-eight hours in bouillon, and accompanied in glucose-agar by green fluorescence and gas formation, may be considered to contain *B. coli*. He found that *B. tetani* and *B. edematis maligni* produce the same appearance as *B. coli* in glucose-agar, even when the surface of the medium is exposed to the air, but in the bouillon the anerobes produce the reaction only when oxygen is excluded. *B. mesentericus* was found to change the red to a dull orange both in bouillon and in glucose-agar.

In bouillon a reaction could be obtained in every instance within twenty-four hours, even with dilutions containing from one to five organisms per cubic centimeters. In extreme dilutions the reaction did not extend to the surface of the fluid in twenty-four hours, and the lower portions had a more orange tint than when the organism was plentiful. With numerous bacilli present the reaction occurred within twelve hours.

W. G. Savage (*Ibid.*, p. 437) finds that it is not a matter of indifference what strength of glucose and of neutral red is used; for if an excessive amount be added, it may not be reduced. To determine whether if *B. coli* is present, it will always give the reaction, and whether it is the only organism which, under the conditions of the test, will give the reaction, he instituted a series of experiments which led to the conclusion that, while a positive reaction is not absolutely diagnostic of *B. coli*, in the vast majority of cases it points to its presence; that while a negative reaction does not absolutely exclude the organism, it makes its presence highly improbable; that the test is very easy of application, and is of great value in the routine examination of water.—*Am. Jour. Med. Sciences*.

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## THE MEAT HABIT, ESPECIALLY IN CHILDREN.

THAT the use of meat is largely a habit, is evidenced by the fact that it does not form an essential part of our dietary, and that it can be discarded with good results. It is a well-known fact that there are multitudes of people who do not use meat, and never have used it. Such individuals compare very favorably, both mentally and physically, with those who use large quantities of meat; in fact, many feats, such as running, bicycle riding, etc., which require the ability to undergo long periods of endurance, are more successfully accomplished by the nonmeat eater than by the meat eater.

Fatigue is caused by the accumulation of fatigue stuffs in the tissues, and these fatigue stuffs are the result of the katabolic processes which are constantly taking place in animal tissues, and no tissue is wholly free from them unless it has been thoroughly washed and all fluid expressed.

When flesh foods are eaten, the fatigue stuffs already in the body are increased in proportion to the amount of fatigue stuffs contained in the tissue ingested. This one fact alone gives us a scientific explanation of the well-known fact that nonflesh-eating animals are possessed of greater endurance than the flesh-eating ones.

That the use of meat is largely a habit is also evidenced by the fact that children do not naturally care for meat; on

the contrary, they have to be taught to like it, much in the same way that they are taught the use of mustard, pepper, etc. By having it constantly set before them and seeing others indulge, they, by example, begin using it little by little until an appetite is created for it. If given the choice between a "nice, juicy beefsteak" and some fresh, ripe fruit, one can readily judge the way in which the natural appetite inclines; the fruit is eagerly sought for, while the meat is left untouched. In the further consideration of this important subject we cannot do better than quote an editorial which appeared in the *New York Medical Journal* of June 7, under the caption of "The Meat Habit in Children":—

"It is but a few years since starchy food for young children was regarded with horror by most physicians, but that feeling is rapidly giving way, as far as concerns children whose salivary apparatus is sufficiently developed, before such considerations as have recently been set forth most ably by so wise a physician as Dr. Joseph E. Winters. Dr. Winters's pamphlet deals with the dietetics of childhood in a comprehensive way, advancing from the requirements of the new-born infant to those of older children; but our limitations in the matter of space will not permit of our noticing more than one feature of the essay; namely, that which refers to the easy acquisition of what may be called "the meat habit in young children."

"One of the most unfortunate evil consequences of an early and liberal meat diet," says Dr. Winters, "is the loss of relish it creates for the physiological foods of childhood—milk, cereals, and vegetables. 'A child that is allowed a generous meat diet,' he adds, 'is certain to refuse cereals and vegetables. Meat, by its stimulating effect, produces a habit as surely as does alcohol, tea, or coffee, and a distaste for less satisfying foods. The foods which the meat-eating child es-



chews contain in large proportions certain mineral constituents which are essential to bodily nutrition and health, and without which the processes of fresh growth and development are stunted.' These mineral constituents, he goes on to say, cannot be introduced into the system in an assimilable form except in organic combination with an albuminous molecule; and in such combination they are found in sufficient proportion to meet the child's needs only in certain vegetables and cereals. Not only will a lack of these mineral constituents 'cause all vigor and vitality to dwindle and die out,' but indeterminate morbid processes supervene in consequence.

"Moreover, to overstimulation of the child's delicate nervous system with meat, and to the defective oxidation of the elements of such food, Dr. Winters attributes abnormally high acidity of the urine, with consequent incontinence of urine, rheumatism, chorea, rheumatic inflammation of the tonsils and torticollis, night terrors, urticaria, angeio-neurotic edema, anemia, convulsions, and petit mal. 'There is more so-called nervousness, anemia, rheumatism, valvular disease of the heart, and chorea' at the present time in children from an excess of meat and its preparations in the diet than from all other causes combined,' he declares."

C. E. S.

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THE Health League of New York City has been incorporated with a capital stock of \$150,000. It aims to establish hospitals for the treatment of the sick by means of nature cure.—*The Medical Age*.

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THE death rate of Russia, according to journals of that country, is higher than in any other country, and the average of life is shorter; it is said to be but twenty-nine years.—*The Medical Age*.

**Medicine and the Teaching of the Gospel.**—That the medical branch of the church missionary society has proved a powerful auxiliary to the parent society in its endeavor to spread the teachings of the gospel, is shown by the satisfactory report of the Medical Mission Auxiliary which was presented at a meeting presided over by the Bishop of Kensington, at St. James's Hall, May 8.

During the year 1901 the number of medical men on the roll of the society has been increased to sixty-eight, and there is now a total of 1,688 beds in the society's hospitals, as compared with 1,613 in the previous year. The number of in-patients has increased from 11,890 to 14,470, and in the out-patient department more than 100,000 additional attendances were registered.

However, it is not at all satisfactory to know that the medical work of the auxiliary is being seriously crippled in several important centers for want of suitable buildings, especially in Gaza, Ispahan, Kirman, Fuh-chow, and Kien-King. The Financial Committee earnestly appeals for gifts toward building new hospitals in these places. The total expenditure of the year under notice was £20,773, as against £17,962 in the previous year, and the balance sheet shows a deficit of £5,920.

There can be no doubt that the secret of the success of the medical mission lies in the fact that medical men hold the key which can unlock the doors to hearts which would otherwise remain closed—the key of sympathy, as the Bishop of Kensington happily termed it. The great beauty of the medical mission, he added, was that the outcome of the highest human science and skill was consecrated to the service of Christ.—*Lancet*.

## The Battle Creek Sanitarium LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.  
F. J. OTIS, M. D., Bacteriologist.  
HOWARD RAND, M. D., Urinalist.  
NEWTON EVANS, M. D., Pathologist.  
ELMER L. EGGLESTON, M. D., Chemist.

### Monthly Résumé of Work Done.

### REPORTS FOR JULY.

#### Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
105 per cent	1	1	2
103 " "	2	0	2
102 " "	2	0	2
101 " "	2	0	2
100 " "	5	1	6
99 " "	9	3	12
98 " "	9	4	13
97 " "	6	2	8
96 " "	5	6	11
95 " "	4	2	6
94 " "	9	6	15
93 " "	2	1	3
92 " "	7	8	15
91 " "	3	3	6
90 " "	5	4	9
89 " "	7	3	10
88 " "	6	2	8
87 " "	0	1	1
86 " "	2	9	11
85 " "	1	3	4
84 " "	3	10	13
83 " "	1	4	5
82 " "	3	4	7
81 " "	0	1	1
80 " "	2	3	5
79 " "	1	6	7
78 " "	1	1	2
77 " "	1	0	1
76 " "	2	2	4
75 " "	2	2	4
74 " "	0	2	2
73 " "	2	5	7
72 " "	1	0	1
71 " "	0	1	1
70 " "	1	0	1
69 " "	0	1	1
68 " "	1	0	1
67 " "	0	1	1
66 " "	1	0	1
65 " "	0	1	1
64 " "	0	1	1
63 " "	0	1	1
62 " "	0	1	1
61 " "	0	1	1
60 " "	0	1	1
59 " "	1	0	1
58 " "	1	0	1
57 " "	1	0	1
56 " "	1	1	2
55 " "	1	0	1
54 " "	0	1	1
53 " "	1	0	1
52 " "	0	1	1
51 " "	1	1	2
50 " "	0	1	1
49 " "	1	1	2
48 " "	0	1	1
47 " "	1	0	1
46 " "	0	1	1
45 " "	0	1	1
44 " "	0	1	1
43 " "	0	1	1
42 " "	0	1	1
41 " "	0	1	1
40 " "	0	1	1
39 " "	0	1	1
38 " "	0	1	1
37 " "	0	1	1
36 " "	0	1	1
35 " "	0	1	1
34 " "	0	1	1
33 " "	0	1	1
32 " "	0	1	1
31 " "	0	1	1
30 " "	0	1	1
29 " "	0	1	1
28 " "	0	1	1
27 " "	0	1	1
26 " "	0	1	1
25 " "	0	1	1
24 " "	0	1	1
23 " "	0	1	1
Total	115	118	233

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm.....	64	40	104
Between 4,500,000 and 5,000,000...	40	30	70
" 4,000,000 " 4,500,000...	13	19	32
" 3,500,000 " 4,000,000...	2	16	18
" 3,000,000 " 3,500,000...	1	3	4
" 2,500,000 " 3,000,000...	1	1	2
" 2,000,000 " 2,500,000...	3	3	6
" 1,500,000 " 2,000,000...	1	4	5
Total.....	121	116	237

#### Gastric Laboratory.—

	Hyper-pepsia.		Simple Dysp.		Hypo-pepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria.....	45	100	6	100	60	88 1/3	111	93 1/3
Between 10,000 and 100,000 bac.....					4	5 1/3	4	3 1/3
More than 100,000 bac.....					4	5 1/3	4	3 1/3
Total .....	45	100	6	100	68	100	119	100

**Examinations of Sputum.**— There were 22 examinations made, all of which were new cases except 2. Tubercle bacilli were found in 6 cases.

Patients were received from the following States and countries: Ohio, 16; West Virginia, 2; Missouri, 10; Indiana, 13; Virginia, 3; Illinois, 12; Arkansas, 4; Wisconsin, 4; Michigan, 21; Minnesota, 2; Pennsylvania, 6; Iowa, 6; Canada, 2; Louisiana, 2; New York, 2; Tennessee, 3; England, 1; Texas, 2; Kentucky, 4; Kansas, 2; Mississippi, 1; Jamaica, 1.

**Urinary Laboratory.**— Total number of cases examined, 245; number of new cases, 176; cases having albumin, 3; cases having sugar, 2; pus, 15; microbes, 45; blood, 6; casts, 5; spermat, 2; bile, 1.

## PUBLISHERS' DEPARTMENT.

### THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.

THE American Electro-Therapeutic Association will hold its twelfth annual meeting Sept. 2, 3, and 4, 1902, at Hotel Kaaterskill, Catskill Mountains, New York.

Scientific papers are already promised of the usual absorbing interest, while the social features arranged are quite unusual in character and pleasure, including local excursions, concerts, balls, banquet, and parlor entertainments.

Reduced rates have been arranged for the members, their families, and friends.

September 1 — Excursion: Leave, per Catskill day line boat, foot of Christopher Street, at 7:30 A. M., or, per night boat on the same line, at 6 P. M. The excursion tickets are \$3 for the round trip, to be obtained at the Catskill Line Office, Pier 43, North River, foot of Christopher Street, or on the boat, the meals and stateroom being extra charge. The option is, with parties to return at any time before September 10. Return to New York per Otis Elevating and Catskill Mountain R. R., Catskill night boat, at 7 P. M. The following are the convention marks of interest as arranged, although subject to change:—

9 P. M., at the Kaaterskill Hotel Executive Council Meeting.

September 2. Tuesday, 1st day.

8 A. M., Breakfast.

9 " Executive meeting.

10 " Scientific sessions.

1 P. M., Dinner.

2 " Excursion per mountain wagons.

4 " Afternoon session.

9:30 P. M., Parlor entertainment and concert.

September 3. Wednesday, 2d day.

8 A. M., Breakfast.

9 " Morning session.

1 P. M., Dinner.

2 " Afternoon session.

7 " Banquet.

9 " Hop.

September 4. Thursday, 3d day.

8 A. M., Breakfast.

9 " Morning session.

1 P. M., Dinner.

Return to New York per Otis Elevating and Catskill Mountain R. R. to Catskill.

Members of the American Electro-Therapeutic Association can avail themselves of the special rate, \$3 per day, given by the hotel during this time.

For particulars, write to Dr. Robert Newman, 101 West 80th Street, Chairman of Executive Council, or to Dr. William Stevens, 79 West 52d St., New York, Secretary Committee of Arrangements.

From communications received, a large attendance is expected.

GEO. E. BILL, M. D., *Secretary*.

255 North St., Harrisburg, Pa.

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There is no region in the world which offers so many attractions to the vacationist who loves the untouched beauty of nature, as can be found in that extensive tract in Canada known as the Muskoka Lakes District. This region, including within its boundaries more than eight hundred (800) lakes and rivers, is situated in the northern part of Ontario, east of Georgian Bay, and north of Lake Ontario. The point of embarkation for the trip on the Muskoka Lakes is one hundred and twelve miles from Toronto, and is reached by the Grand Trunk Railway.

The lakes in this vast region which stand out in more prominence than the others are the Muskoka Lakes, composed of three bodies of beautiful, translucent water, their names being Lake Muskoka, Lake Rosseau, and Lake Joseph, all three being connected, and giving a continuous steamboat route of more than fifty miles. Being at an altitude of one thousand feet above the sea level, this region is peculiarly suited by the purity of the air to bring health and strength to those whose physical and mental natures have become exhausted through too close application to indoor work.

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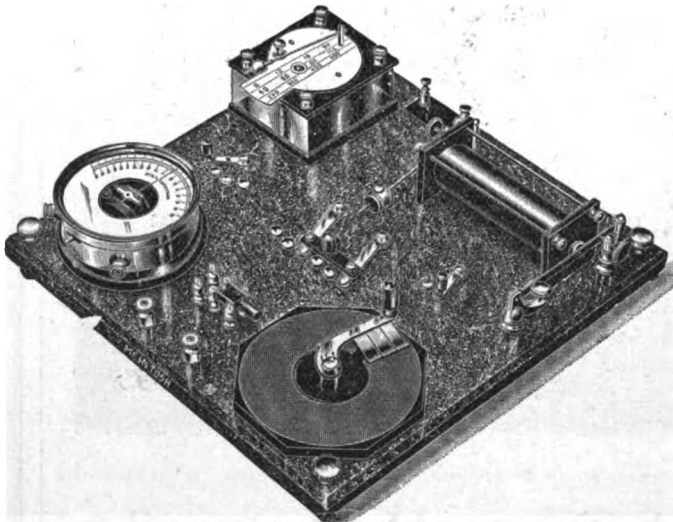
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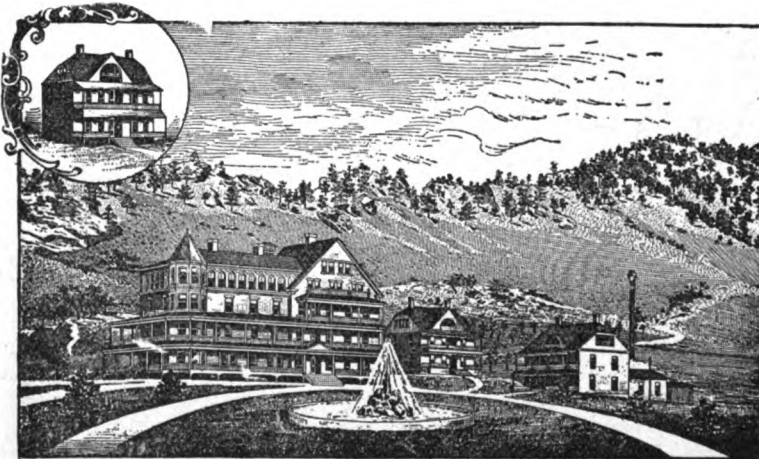
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